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Issued January 19, 1907.

United States Department of Agriculture,

FOREST SERVICE—Circular 71.

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FOREST PLANTING LEAFLET.

CHESTNUT (Castanea dentata).

SIZE AND FORM.

The chestnut is among the largest of our hardwood trees, and in the region of its best development has been known to reach a height of 120 feet and a diameter of great size. Throughout the greatest part of its range, however, it is much smaller, with an average height of 80 to 100 feet and a diameter of from 2 to 4 feet. When grown in the forest it forms a tall, clean, fairly cylindrical trunk; in the open it assumes a form like a fruit tree, with a short, thick trunk and a broad, spreading crown. The bark is thick and deeply ridged, and the root system is extensive, in both lateral and vertical development.

RANGE.

The chestnut is distributed throughout the eastern part of the United States at elevations varying from sea level in Massachusetts to 5,000 feet in North Carolina. It ranges from southern Maine southward through New England, but in this region is most abundant in the lower valleys of the Merrimac and Connecticut rivers. Except near the sea, it is common in Rhode Island and Connecticut and as far south as Delaware. It is found also in the Province of Ontario and in the Eastern States, especially in New Jersey, Pennsylvania, and parts of Maryland. Further south it is found along the Appalachians to Alabama, growing well in all soils above 2,000 feet in elevation, but less abundantly below. In the Middle West it is confined to Michigan, Indiana, and Illinois.

Large areas throughout the East, particularly in New England, New York, Pennsylvania, and Maryland, are well adapted to chestnut. Outside of its natural range, however, the success of this species is doubtful. Chestnut can be grown fairly well throughout Missouri and southeastern Iowa, in the eastern counties of Nebraska and Kansas, and in the southern half of Minnesota, but nowhere on prairie soil is it long-lived or of first-rate growth. In Colorado it grows well under irrigation, and would probably succeed in other parts of the West if well watered. If it is planted too far north the shoots fail

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to become woody before they are nipped by the early frosts. The tree will endure the heat and cold of its natural home and will remain thrifty in sunny, dry situations, but is very susceptible to injury from hot winds.

HABITS AND GROWTH.

Chestnut will thrive on a variety of soils, from almost pure sand to coarse gravels and shales. On limestone soils, however, it nowhere makes good growth. In general it prefers the dry, well-drained, rocky land of the glacial drift to the richer, more compact alluvial soil of the lowlands. Chestnut does not need a rich soil so much as one whose physical structure insures good drainage. Light is essential to the tree, since it is somewhat intolerant of shade.

Few of our valuable hardwoods are more rapid in growth than chestnut. Seedlings usually attain a height of from 10 to 15 inches at the end of the first season. From then until the thirtieth year the annual height growth will average from 15 to 20 inches. Coppice sprouts make even more rapid growth during the same period, but in later life their growth falls off rapidly.

Ordinarily the chestnut, as a forest tree, is little troubled by insects or fungi. Several forms of borers work in the wood and under the bark, and their ravages are sometimes extensive. The nuts are attacked by the larvæ of two or more species of weevil, but to the timber grower this is not serious. Trunks of the young trees in warm situations are sometimes affected by a body blight or "sun scald." The bark cracks and loosens on the south and west sides of the tree, and the affected portion finally dies. The extent of injury from this source is, however, not great. During the past ten or fifteen years a new disease of unknown cause has been doing considerable damage.

ECONOMIC USES.

Chestnut timber is in great demand. The wood is light, moderately strong, coarse grained, and elastic. It works easily and is very durable in contact with the soil. In seasoning, the wood often checks and warps, but damage from this source is not serious. It is used in cabinet work and cooperage, and for fence posts, telegraph and telephone poles, ties, and mine timbers. The presence of tannin in the wood increases the demand for small-sized and inferior material, and large quantities are used in the manufacture of tanning extracts.

Except in portions of the Southern Appalachians, very little of the original chestnut remains, but the coppice reproduction is so rapid that a considerable supply of small-sized timber is still available. The excellent qualities of the wood insure a permanent demand and good price.

METHODS OF PROPAGATION.

Chestnut plantations may be established by direct seeding or by the use of nursery-grown seedlings. Seed may be purchased, or collected from trees in the vicinity. To prevent drying out and consequent loss of germinating power, collected seeds should be kept stratified in moist sand until the following spring.

Home-grown seedlings are usually superior to those purchased from commercial dealers, and are much cheaper. The nursery should be located on fresh, well-drained, fertile soil, under conditions such as are usually present in an old garden spot. Thorough cultivation of the soil is required, but the preparation of seed beds is unnecessary.

Seed should be planted, 10 to 12 per linear foot, in nursery rows 18 inches apart. Care should be taken not to cover the seed more than 1 inch deep.

A bushel contains 6,500 to 8,000 nuts, sufficient to plant 650 linear feet of nursery rows and to produce at least 4,000 plants. These rows will cover an area of 975 square feet. While in the nursery, seedlings require careful cultivation and should be kept entirely free from weeds.

PLANTING.

When planting on permanent sites the trees should be set 5 or 6 feet apart each way, the width depending upon the quality of the site and the possible market for the product of thinnings. In good situations the wider spacing is advised.

If the trees are to be grown directly from seed without transplanting, seed spots should be prepared, spaced as above. Two or three seeds should be planted in each and covered about 1 inch deep with fine earth. Only one tree should be allowed to remain in each hill. This method is recommended by many, and where there is no danger of squirrels it will prove satisfactory and less expensive than the use of seedlings. In general, however, the seedling plantation will be safer and will give better results.

The system of management best suited to the chestnut is the pure coppice, with a rotation of from twenty-five to thirty-five years. Coppice makes more rapid growth than seedling forest, and produces timber in many respects superior. The species also grows well in mixtures, particularly with the white and red pines and the European larch, and also with the oaks, ashes, and maples.

CULTIVATION AND CARE.

On the prairies, plantations should be cultivated until the young trees are well established, but in the East cultivation is unnecessary

If insects appear in alarming numbers in the forest, specimens, together with an account of their habits, should be sent to the Bureau of Entomology of the Department of Agriculture for identification and suggestions as to their destruction or control.

The greatest enemy of the chestnut, as of other forest trees, is fire, from which it should at all times be fully protected.

Approved.

JAMES WILSON,
Secretary.

WASHINGTON, D. C., *November 24, 1906.*

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